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ABSTRACT

Containing a series of activities that complement the mathematics programme in the primary and junior division (grades 1-6) of an Ontario school system, this resource book relates mathematics skills to everyday usage, allowing children to recognise the value of mathematics in the practical sense. All objectives and strategies are designed to reinforce the corresponding basic mathematics concepts. Planned to provide a supplementary resource pack to accompany the existing Leeds and Grenville County (Ontario) Primary and Junior Mathematics Guidelines, the document provides classroom teachers with strategies and examples of practical, short, and interesting lessons which can be carried out with a minimum of preparation and with the use of readily available materials, often within schoolyard boundaries. Each unit lists an aim, topic, location, general objective, specific objectives (with examples), and follow-up activities. Overall objectives are listed as: to study and experiment both inside and outside of the classroom; to extend basic operations, measurement, graphing, problem solving and geometry skills; to participate in interesting, motivating and enjoyable learning experiences; to show ability to cooperate while developing related mathematical skills; to develop social skills; and to extend values and decision-making. (AN)

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THE LEEDS AND GRENVILLE COUNTY BOARD OF EDUCATION

EXPERIENTIAL EDUCATION (GRADES 1 - 6)

A RESOURCE BOOK FOR MATHEMATICS

Experiential Education can be defined in simple terms as giving pupils the opportunity to have practical experiences that relate to the topics they are being taught. In most cases this means experiences outside the classroom.

The Experiential Education committee has developed a series of activities that complement the mathematics programme in the primary and junior division. These effectively relate the skills to everyday usage and should allow children to recognise the value of mathematics in the practical sense.

The activities have been cross referenced with the objectives listed in the board guidelines and can be easily incorporated into the lesson plans.

We commend Bob Griffin and his committee for their initiative in creating this new resource material.

The recognition that 'out of classroom' activities need not involve travel beyond the school boundaries and require little preparation is welcome. The ability to vary classroom activity should be of assistance to all staff.

N. W. Ellis
and
J. R. McNeill
Superintendents of Education
- Programme

JRM:HGS

RC 012 327

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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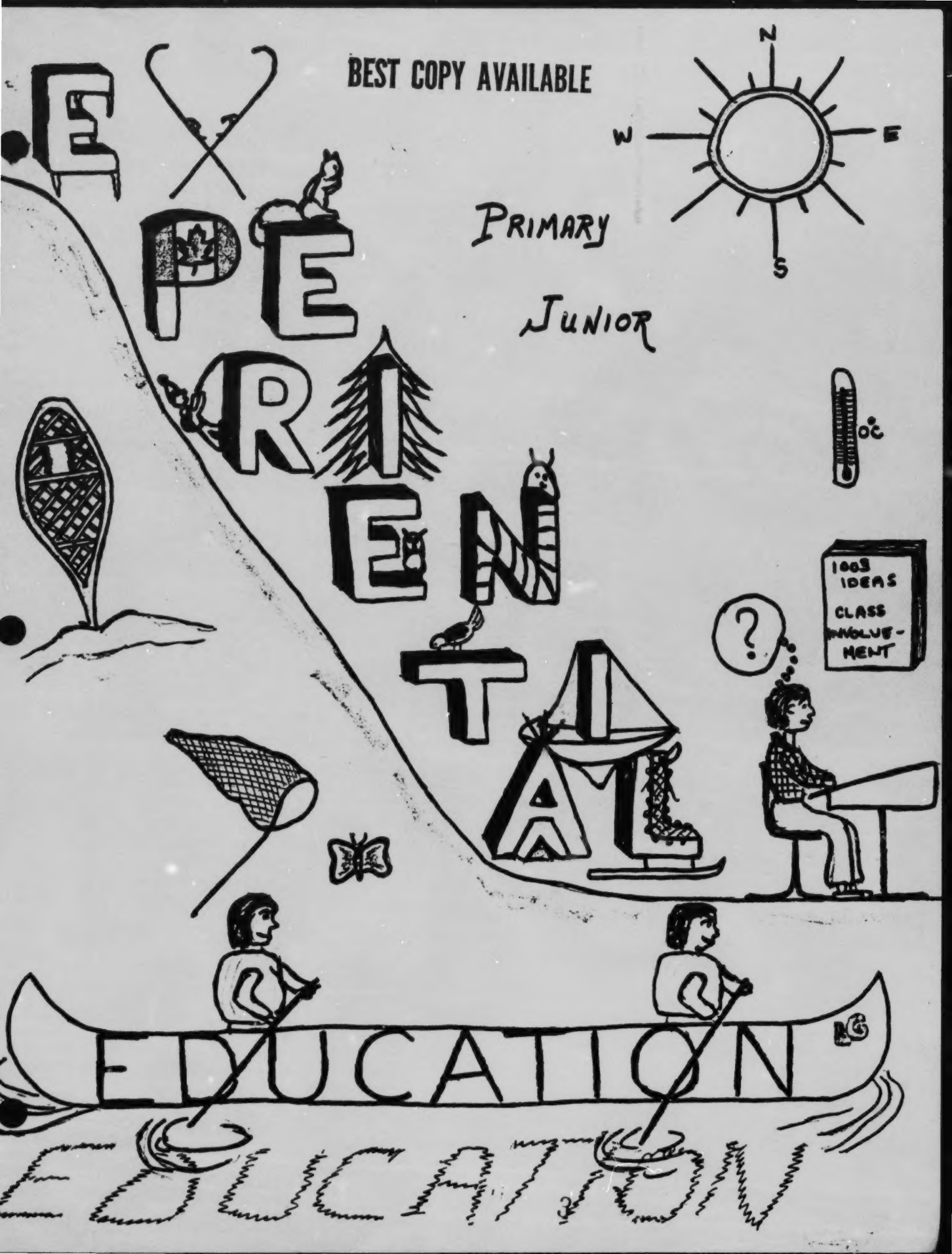

THE LEEDS AND GRENVILLE COUNTY BOARD OF EDUCATION

EXPERIENTIAL EDUCATION

PRIMARY & JUNIOR DIVISIONS - 1980

June 1980

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EXPERIENTIAL CURRICULUM WRITING TEAM

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"Few things help an individual more than to place responsibility upon him, and to let him know that you trust him."

Booker T. Washington

GUIDE FOR TEACHERS:

Experiential Education, as defined, provides experiences in keeping with educational objectives outside the normal classroom situation. It represents a new range of educational experiences used in the learning process.

Our intent is to provide a supplementary resource pack to accompany the existing Leeds and Grenville Primary and Junior Mathematics Guidelines. The objectives pertaining to Primary Mathematics are printed on pink, and are cross-referenced with those in the Leeds and Grenville Primary Mathematics Guideline. The objectives outlined in this document which pertain to Junior Mathematics are colour coded and cross-referenced with those in the Leeds and Grenville Junior Mathematics Guideline. The Experiential Education objectives included in this resource document deal with basic operations, graphing, geometry and measurement. All objectives and strategies are designed to reinforce the corresponding basic mathematics concepts.

This resource pack will provide the classroom teacher with strategies and examples of practical, short and interesting lessons which can be carried out with a minimum of preparation and with the use of readily available materials.

Teachers should realize that until the novelty of out-of-classroom situations has worn off, not all lessons may progress as efficiently as desired.

The Experiential Education Curriculum Committee
(Primary and Junior Areas)

COLOUR CODING SYSTEM:

This programme has been set up with a colour coding system:

a) Suggested Primary (K,1,2,3) objectives on pink sheets.
b) Suggested Year 4 objectives on blue sheets.
c) Suggested Year 5 objectives on yellow sheets.
d) Suggested Year 6 objectives on green sheets.
e) General Junior Objectives (those which can be used in each of the Junior levels) are on buff sheets.
f) Appendices (Sample Student Worksheets) are on white sheets.

NUMBERING SYSTEM:	5	W	O	1
	Suggested Level	Unit	Topic	Specific Objective Number
		i.e.-Whole Numbers	i.e.-Operations	

For certain general Primary level objectives the letter "P" is used instead of K, 1, 2, 3, providing a greater choice of ability groupings. Similarly, the letter "J"(Junior) will be used instead of 4, 5, 6, where the objectives could be used to reinforce concepts in each of these levels. It is our intent to provide as much flexibility as possible.

RATIONALE:

The Experiential Education Curriculum Committee hopes that these objectives written for "Out-of-Classroom" experiences with in-class follow-up will be useful and practical for teachers. These objectives are by no means mandatory; however, they are based upon Ministry and County expectations. In writing these suggestions as a follow-up to the Leeds and Grenville Primary and Junior Mathematics Guidelines, the Committee hopes that the teachers will use some of these objectives to reinforce previously taught concepts.

The Experiential programme in any school should provide additional learning opportunities for each child to the limit of his or her potential.

The Committee sees the Experiential Programme as furthering these objectives:

(1) to study and experiment both inside and outside of the classroom;
(2) to participate in interesting, motivating and enjoyable learning experiences;
(3) to extend basic operations, measurement, graphing, problem solving and geometry skills;
(4) to show ability to co-operate and to share information while developing related mathematical skills;
(5) to develop social skills as well as self-confidence and self-reliance;
(6) to extend values and decision-making.

The programme would maintain the philosophy of the 1970 committee on Outdoor Education for Leeds and Grenville as follows*:

(1) a respect for and an appreciation of the natural environment;
(2) seeing the total environment as a learning area;
(3) perception of the inter-relationship of all living things;
(4) awareness of the wise use of the environment for recreation;
(5) conception of the need for conservation in all aspects of the outdoors;
(6) the development of the child's ability to enjoy himself or herself thoroughly and to function efficiently in our democratic society.

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* The Leeds and Grenville County Board of Education - Guidelines for Outdoor Education, prepared by the Committee on Outdoor Education, November, 1970.

RATIONALE: (cont'd)

Every effort has been made to ensure that the units and topics included comply with the Ministry recommendations; teachers can feel assured that they are meeting the needs of the child as outlined in the Formative Years.

It is essential to pre-plan out-of-classroom experiences and make them an integral part of the child's continuous progress. When teacher and student plan these experiences together, they become a natural extension of in-school subjects. Thus, objectives can be established and results evaluated.

PREAMBLE:*

In the past we have attempted to develop skills of communication and inquiry, methods of problem solving, and personal growth in ever-increasing artificial situations. We have saturated the educational environment with film, T.V. programs, displays and printed materials and expected that knowledge thus acquired would be transferred to various out-of-school life situations. Often this transfer did not take place.

Just beyond the classroom lies a different world — the out-of-doors. Children often live in it, and accept it as part of their everyday life without realizing its importance to their form of life and style of living. As a classroom it is free and readily available, yet how often do we take advantage of this natural stimulant of the student's sense of curiosity and wonder to provide worthwhile learning experiences?

Outdoor education is not new. For the most part, mankind has tended to forget his relationship with his environment. With the ever-growing amount of leisure time, and the increasing need for conservation and reclamation of resources, the need for experiences of this type becomes more pressing. Every child has a right to enjoy, or learn to enjoy, the beauty and rich variety of natural settings of which he or she is a part. Educators have realized the importance of exposing students to the natural environment and we, as teachers, have the privilege of opening young eyes to the structural diversity of the planet on which we live.

This concept is commonly referred to as outdoor education, the development of which is advocated in "Living and Learning" as providing an understanding of the way man and his environment shape one another.

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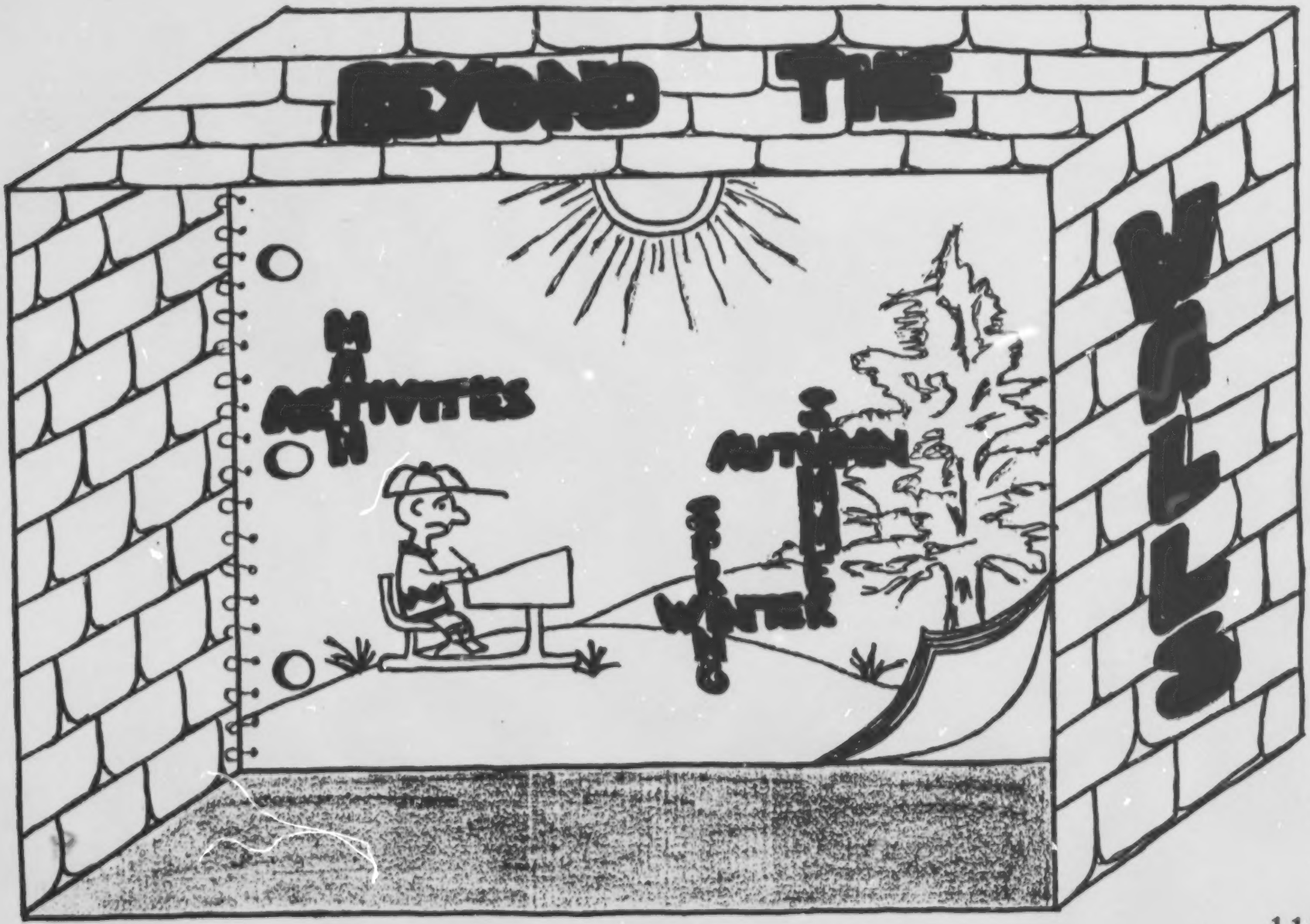
* The Leeds and Grenville County Board of Education - Guidelines for Outdoor Education, prepared by the Committee on Outdoor Education, November, 1970.



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INTRODUCTION:*

To start, just take your class outdoors for a short walk. Ask them to identify a variety of sounds and other sensory experiences. Don't be alarmed if they are noisy, impetuous, or over-excited. This is a new experience for them, as it may be for you. Customarily, after the second or third trip in the out-of-doors, much of the novelty of the experience will wear off and you will be able to settle into a productive pattern of more structured study, in a classroom that is as big as you want it to be.

It is hoped that teachers of all grades will take their classes out-of-doors on several occasions throughout the school year. The duration of the activities may range from a few minutes, to several hours, to several days, depending on the nature of the activities, the skills required and the interests of the students and teacher. Your schoolyard may provide the experiences required, or trips further afield may serve your purpose better.

TEACHER PRE-PLANNING:*

Most trips or activities will require pre-planning. In the case of a visit to an establishment or a private property, permission would be required.

Student behaviour, lunches, clothing, equipment, parental volunteers, parental notification, washroom facilities, emergency phone number and also facilities for treating injuries, etc., and administrative authorization should be attended to ahead of time when applicable.

Teachers should be familiar with the facilities available and the activities possible in the particular area of choice. (For further details see The Leeds and Grenville Field Trip Committee Report.)

On occasion large-group instruction may be found useful but, normally, better results will be obtained by the small-group project or individual student investigations approach. Time should be allowed for recreation and activities of interest to students.

FOLLOW-UP:*

Maximum benefit will be derived from the outdoor education experience when follow-up is immediate and adequate. Frequently the actual time in the field is all too brief and students must be given ample time to follow-up the experiences meaningfully on their return. This follow-up provides an opportunity for subject integration. Students should be allowed to share their findings with others in the group, and this may be done in a variety of ways, i.e. - charts, graphs, language experiences, communications media, arts or crafts, etc.

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* The Leeds and Grenville County Board of Education, Guidelines for Outdoor Education, prepared by the Committee on Outdoor Education, November, 1970.

SUPPORT AND REFERENCE MATERIALS:

The following is a list of unit studies related to the specific objectives. As other resources are made available this list will be updated.

I. Rideau Valley Conservation Authority

Outdoor Education Literature:

1. Big Tree Survey: - circumference plus height plus 1/4 crown diameter.
2. Economic Value of Farm Woodlot: - using measured plot on conservation area.
3. Nature Trail Projects: - trees, flowers, insects, birds, soil, temperature, pressure, wind, intensity of light, etc.
4. Orienteering: - parts and use of a compass, practice games.
5. Orienteering on Nature Trails: - use of compass to find changes of direction on trails - drawing trails to show length and directions.
6. Surveying Activities: - profile of a slope using cross staff.
7. Tree Count: - tabulation of trees of various diameters.
8. Winter Studies: - wind chill, temperatures in snowbanks, depths of snow, light intensities, soil temperatures, depth of frost, etc.
9. Stream Studies

General Note:- These booklets are available from the Rideau Valley Conservation Authority, Box 599, Manotick, Ontario, KOA 2NO, at an approximate cost of $1.00 per copy.

II. "Facts" for Environmental Studies - (Ministry of the Environment, Ontario)

These "Sets" are very worthwhile, and can be obtained free from:

Educational Resources Co-ordinator
Information Services Branch
Ministry of the Environment
135 St. Clair Avenue West
Toronto, Ontario
M4V 1P5

III. K-6 Regional Science Outlines for "Living Things" Units

This package includes two topics at each grade level, K-6. (These were designed during the summer of 1979)

IV. Elementary Science Study (E.S.S.)

These units have been used by elementary teachers for many years with considerable success. A selection of 25 of these topics which relate to K-6 science themes will soon be on hand at the Board Office.

V. S.T.A.O. Catalogue of Curriculum Resources

The Science Teachers Association of Ontario has a comprehensive library of science curriculum materials at Queen's University.

VI. The following series cover a wide range of topics at the K-6 level:

1. Examining Your Environment, Holt, Rinehart & Winston
2. Searching For Structure, Holt, Rinehart & Winston
3. Contours: Studies of the Environment, Prentice-Hall
4. Investigations in Science - A Modular Approach, Wiley
5. Ryerson Science in Action, McGraw-Hill Ryerson
6. Investigating Science Series, Billhaven House
7. Thinking About Science, Reed Education
8. STEM Science, Addison-Wesley
9. Golden Nature Guide, Golden Press
10. Science, Houghton-Mifflin
11. Science, Macdonald
12. Nature, Macdonald

VII. Periodicals

The following periodicals will be of interest to you and your students:

1. World
2. Owl
3. Ranger Rick
4. International Wildlife
5. Beaver
6. Magook
7. Science and Children

VIII. General Interest

1. Creative Science Experiences for the Young Child, Scholar's Choice

2. Ten-Minute Field Trips, Doubleday, Ferguson

3. Reader's Digest Science Readers, Reader's Digest

IX. Kits: These materials are presently listed in the Resource Kit Catalogue:

Kit #	Title & Description	Division
35018	THE SEASONS - NATIONAL GEOGRAPHIC SERIES - 5 filmstrips, 5 cassettes - The cycle of seasons, the changes that occur in living things. The growth of plants, nest building of birds in the spring, insects thriving in summer, birds migrating in autumn, animals seeking food in winter. The changing seasons: Summer Winter, Spring and Autumn.	Primary/Junior
35030*	ANIMALS AROUND YOU - 5 filmstrips, 5 cassettes, teacher's guide - Insights into animal needs and behaviour gained by keeping a cat, dog, or other pet. Both familiar and unusual pets. How to choose a pet and care for it. How farm animals help people and require human care. Special diets and homes devised for zoo animals. Learning about small creatures that live in parks, lawns and gardens.	Primary/Junior
35032	THE WAYS OF PLANTS - The Ways of Plants is a language experience/basic life science programme for young children. It centres around ten story poems by Aileen Fisher, each designed to present a different aspect of plant life. The story poems are presented in ten books and corresponding sound filmstrips.	Primary
38042	GEOMETRIC PLASTIC FORMS - 14 geometric plastic forms, 1 booklet - Kit acquaints students with geometric solids not frequently encountered.	Primary/Junior

*This kit could be used with the Primary and Junior Graphing Objectives

38044 TRAVEL METRE — Junior/Inter.
- 1 game board, game pieces, 32 Metric cards, 32 International Road Sign Cards
- This kit involves metric distances, questions and activities, as well as a number of international road signs.

X. Resource Packages

1. Environmental Resource Package, The Canadian Red Cross Society
- a variety of games for environmental studies.

2. Conservation Education in Survival Power, Canadian Wildlife Federation

3. Environmental Education Resource Materials, available from the Ontario Government
- includes annotated descriptions of printed materials.

- Ministry of Natural Resources
Brockville District Office
101 Water Street
Brockville, Ontario
K6V 5Y8
(613) 342-8524

XI. Films

Film #	Title & Description	Division
001052	Maple Sugar	Pr/Jr
001140	Winter Bird Hike	Pr/Jr
001164	Let's Make a Map	Pr/Jr
001229	What is a Tree?	Jr
001236	The Changing Forest: A First Film	Pr/Jr/Inter
001261	I Like Trees	Pr/Jr
001361	What's So Important About A Wheel	Pr/Jr
001355	Directions for Beginners: N, S, E, W	Pr/Jr
001422	Measure Weight (Think Metric)	Pr/Jr
001423	Measure Length (Think Metric)	Pr/Jr
001424	Measure Volume (Think Metric)	Pr/Jr
001506	Metric Measurement: Volume	Jr/Inter
002007	The Changing Forest	Jr/Inter/Sr
002182	Winter: A Story of Survival	Pr/Jr
002636	Free to Be You and Me: Friendship & Co-operation	Pr/Jr
002704	Metric Measurement: Length & Area	Jr/Inter/Sr
003396	Moving to Metric	Jr/Inter/Sr

XII. Videotapes

B.P.N.#	Title & Description	Division
000539	Mathematical Relationships - Statistics	4 - 6
003751	Mathematical Relationships - Geometric Shapes	4 - 6

XIII. Locations of Parks

1. The Buell's Creek Conservation Area: Please book the area by telephoning The Leeds and Grenville County Board of Education Resource Centre, 342-0371.

2. St. Lawrence Islands National Park, Mallorytown Landing: A manual outlining their programme is available. Working units on Geology and Pond Study are available also. Call direct - 923-5241.

3. Foley Mountain: Telephone Barry McQuay at 273-3255. There is a variety of programmes offered.

4. Charleston Lake Provincial Park: North of Lansdowne. Telephone 659-2065.

5. Minna Anthony Common Nature Centre, Wellesley Island State Park, Alexandria Bay, N.Y.: There are two full time naturalists available with excellent facilities. Mr. Bob Wakefield is a naturalist there. Telephone: (315) 482-2479.

Information related to the above centres should be in your school office or library.

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WHOLE NUMBERS

Maps

Menu For Camping Trip

hamburger	salt
buns	pepper
relish	bananas
catsup	beans
Tomatoes	weiners
Onions	
eggs	
bacon	
butter	
bread	

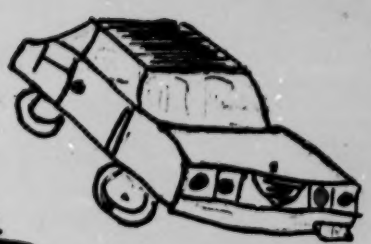
JYV 902

KLH 325

KJH 223

Monte Carlo

Bikes

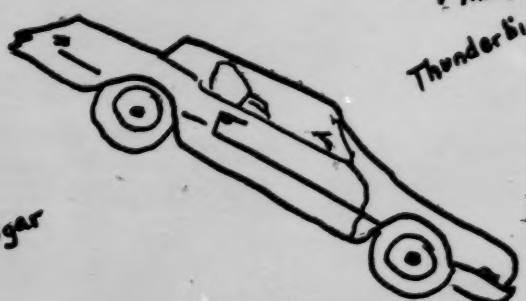


Chevette

Zephyr

Thunderbird

Grenada



Chevy Van

Cougar

Equipment

Unit WHOLE NUMBERS

Aim **The Primary pupil will use the school site as reinforcement for mathematical concepts and arithmetic operations involving whole numbers.**

Topic Operations Involving Vehicles

Location School Yard and Parking Lot

General Objective

The Primary pupil will develop further proficiency in the use of standard algorithms for the four basic operations.

Specific Objectives

PW01 The Primary pupil will be able to count the number of vehicles in the school yard and will classify them according to type or model.

PW02 The Primary pupil will be able to classify automobiles according to colour, number of doors, model, import or domestic, full size or compact.

PW03 The Primary pupil will be able to count the number of wheels, hubcaps, and headlights on the automobiles. More advanced Primary pupils will be able to perform one-step problems involving these numbers.

PW04 The Primary pupil will be able to read and record licence numbers. More advanced Primary pupils will be able to perform addition and subtraction involving these numbers.

PW05 The Primary pupil will be able to count the number of vehicles passing the school in a given period of time. More advanced Primary pupils will be able to classify these according to the types of vehicles and perform the four operations as well as solving one-step problems.

PW06 The Primary pupil will be able to count the bicycles on the school yard. More advanced Primary pupils will be able to classify the bicycles according to speed, model, size of wheel, and perform the four operations using these numbers.

OPERATIONS INVOLVING VEHICLES

Objective PW01

The Primary pupil will be able to count the number of vehicles in the school yard and will classify them according to type or model.

Example — Count the number of cars, trucks, buses, vans and bikes in the school yard and use large experience chart paper to tabulate the results. Magazine cut-outs of vehicles could be used. An alternate suggestion would be to use toys or models to show the distribution of vehicles.

Objective PW02

The Primary pupil will be able to classify automobiles according to colour, number of doors, model, import or domestic, full size or compact.

Example — Pictures of automobiles might be pasted onto experience chart paper to tabulate the results. (A supply of car magazines could be helpful.)

(See Primary Appendix "A")

Objective PW03

The Primary pupil will be able to count the number of wheels, hubcaps, and headlights on the automobiles. More advanced Primary pupils will be able to perform one-step problems involving these numbers.

Example — On experience chart paper, the pupil will draw a picture of the vehicle and print the number symbol for the total number of wheels.

(See Primary Appendix "B")

OPERATIONS INVOLVING VEHICLES (cont'd)

Objective PW04

The Primary pupil will be able to read and record licence numbers. More advanced Primary pupils will be able to perform addition and subtraction involving these numbers.

Example (See Primary Appendix "C")

Objective PW05

The Primary pupil will be able to count the number of vehicles passing the school in a given period of time. More advanced Primary pupils will be able to classify these according to the types of vehicles and perform the four operations as well as solving one-step problems.

Example (See Primary Appendix "D")

Objective PW06

The Primary pupil will be able to count the bicycles on the school yard. More advanced Primary pupils will be able to classify the bicycles according to speed, model, size of wheel, and perform the four operations using these numbers.

Example One-step problems might also be developed using this information.

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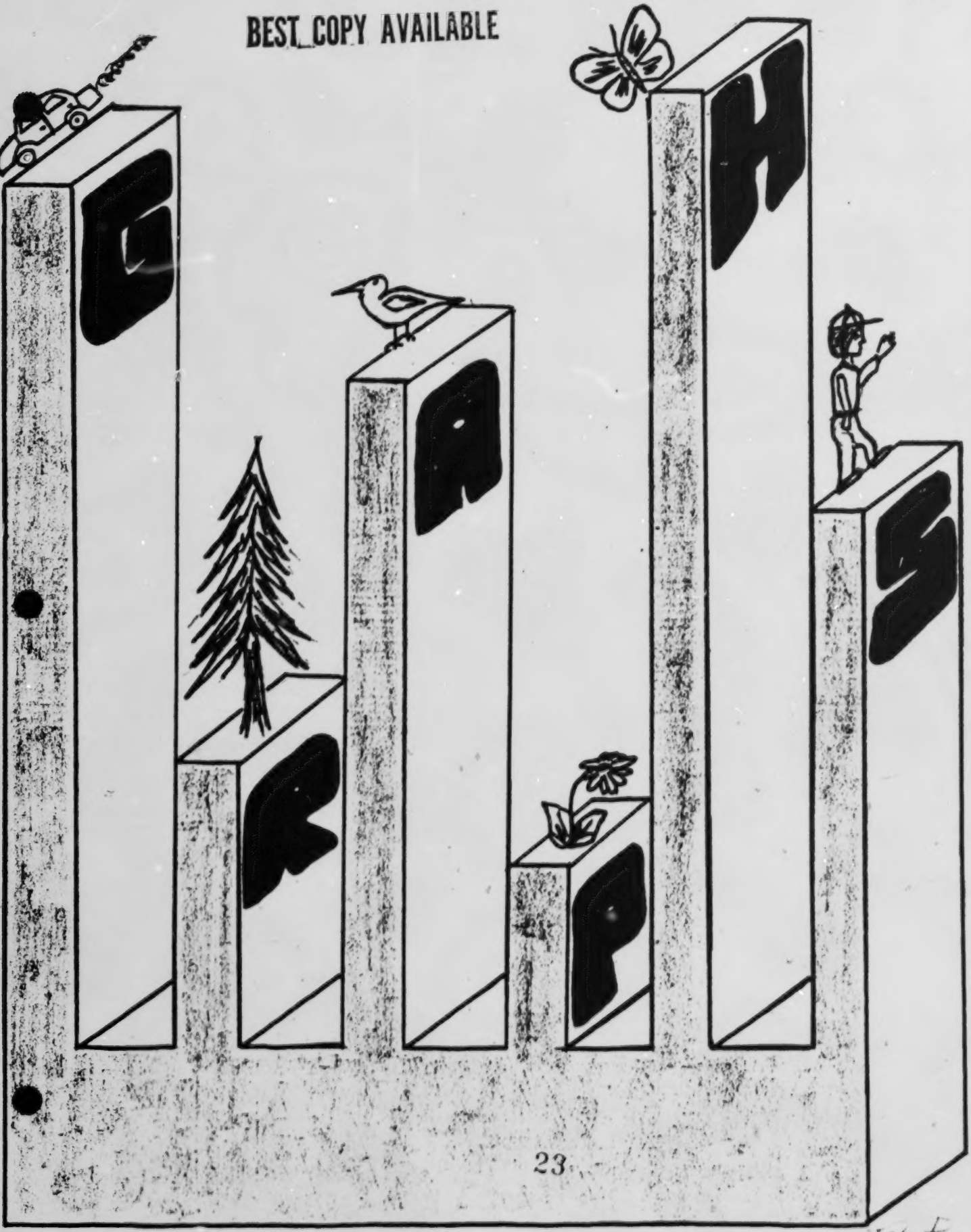

Unit GRAPHING

Aim The Primary Pupil will use the school site as reinforcement for mathematical concepts and arithmetic operations involving Picto Graphs, Circle Graphs, Line or Bar Graphs.

Topic Circle, Picto, Line and Bar Graphs

Location School Yard and Parking Lot, Nature Hike

General Objective

The Primary pupil will develop further proficiency in graphing information.

Specific Objectives

PG1 The Primary pupil will be able to graph automobiles according to colour, number of doors, make and size.

PG2 The Primary pupil will be able to graph bicycles according to number of speeds, colour, model, girls or boys, size of wheel.

PG3 The Primary pupil will be able to graph trees according to species, coniferous or deciduous, smooth or rough bark, seeds, leaf or needle patterns.

PG4 The Primary pupil will be able to graph body statistics of classmates according to height, mass (weight), shoe size, sex, hair colour, eye colour.

PG5 More advanced Primary pupils will be able to record and graph weather conditions according to temperature, precipitation, cloud types and barometric pressure.

PG6 The Primary pupil will be able to classify and graph birds according to colour, eating habits, size, species, body shape, sound, location and size of nests including materials used in construction.

PG7 The Primary pupil will be able to record and graph information on other pupils according to number and kinds of pets, hobbies, number of members of a family, distance from home to school, occupations of parents, favorite T.V. programmes and favorite foods.

CIRCLE, PICTO, LINE AND BAR GRAPHS

Objective PG1

The Primary pupil will be able to graph automobiles according to colour, number of doors, make and size.

Example

Explain first, in the classroom, the information to be collected. Take pupils out to the parking lot and have them write down the models of cars.

Data:

Ford	6
General Motors	10
Chrysler	4

Using the data, make one of the following:

(a) Picto graph
(b) Bar graph

After making the graphs, have the pupils discuss how the car companies might make use of their findings.

Objective PG2

The Primary pupil will be able to graph bicycles according to number of speeds, colour, model, girls or boys and size of wheel.

Example

Group the pupils in groups of 4. Have them survey the bicycle rack to determine how many bikes there are of each speed, how many there are of a specific model, etc. After compiling this data, the pupils develop related graphs.

Objective PG3

The Primary pupil will be able to graph trees according to species, coniferous or deciduous, smooth or rough bark, seeds, leaf or needle patterns.

Example

Using the same method as in PG2, mark out an area in a woodlot. Have the pupils identify and count each kind of tree. Make a bar, line, picto or circle graph of the results.

CIRCLE, PICTO, LINE AND BAR GRAPHS (cont'd)

Objective PG4

The Primary pupil will be able to graph body statistics of classmates according to height, mass (weight), shoe size, sex, hair colour, eye colour.

Example — Group the pupils as for other graphing activities and compile related information by surveying classmates. Picto and Bar graphs are suggested here.

Objective PG5

More advanced Primary pupils will be able to record and graph weather conditions according to temperature, precipitation, cloud types and barometric pressure.

Example — Have the pupils measure and record on a wall chart the amount of precipitation each day. They could also collect this information from the evening news, the newspaper or a weather station.

Objective PG6

The Primary pupil will be able to classify and graph birds according to colour, eating habits, size, species, body shape, sound, location and size of nests including materials used in their construction.

Example — The pupils could collect information from personal experiences, a nature walk, films, or seasonal observation of different birds. A Picto graph is suggested.

Objective PG7

The Primary pupil will be able to record and graph information on other pupils according to number and kinds of pets, hobbies, number of members of a family, distance from home to school, occupations of parents, favorite T.V. programmes and favorite foods.

Example — These topics lend themselves to Picto graphs. A questionnaire could be developed first, then these could be used to compile the results for the graphs.

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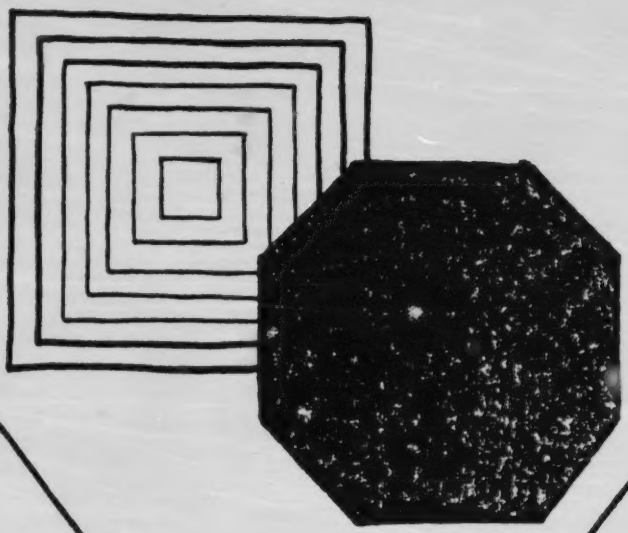
GEOMETRY



R. Hart

Unit GEOMETRY

Aim The Primary pupil understands that Geometry is the natural language of spatial concepts and space relationships in the real world.

Topic Three-Dimensional Geometry

Location School Yard

General Objective

The Primary pupil will be able to understand relationships involving space and shape.

Specific Objectives

KTG1 The Kindergarten pupil will be able to match the following shapes, i.e. - circle, square, triangle and rectangle, to objects in the vicinity of the school yard.

1TG1 The Primary pupil, using plasticine or clay, will be able to create the following shapes: cube, sphere, cone, cylinder.

1TG2 The Primary pupil will be able to classify objects which roll and/or stack.

1TG3 The Primary pupil, given concrete objects such as fruits, vegetables or building blocks, will be able to explore their shapes and textures.

1TG4 The Primary pupil, using the concept of the geo-board, will be able to use pegs and a string to define an area or areas.

1TG5 The Primary pupil, using a geo-board and elastic, or pegs and string, will be able to construct straight lines, squares, rectangles and triangles.

2TG1 The Primary pupil will be able to identify line segments, points and curves on the school yard.

2TG2 The Primary pupil will be able to categorize shapes in nature according to colour, thickness, texture and size.

3TG1 The Primary pupil, using various metric containers and rice, beans, sand, salt or flour, will be able to fill these containers to determine their volume.

THREE-DIMENSIONAL GEOMETRY

Objective KTG1

The Kindergarten pupil will be able to match the following shapes, i.e. - circle, square, triangle and rectangle, to objects in the vicinity of the school yard.

Example

Circle: flowers, basketball hoops, wheels, balls, drains, garbage cans.

Square: hop-scotch, play-ground equipment.

Triangle: leaf shapes, evergreens, homeplate.

Rectangle: bricks, bases, soccer field, swing seats, hop-scotch, rink.

Take the pupils for a walk to discover these shapes on the school yard. Experience chart stories can be developed nicely from this experience also.

Objective 1TG1

The Primary pupil, using placticine or clay, will be able to create the following shapes: cube, sphere, cone, cylinder.

Example

The pupil may compare these shapes to objects in the school yard.

Objective 1TG2

The Primary pupil will be able to classify objects which roll and/or stack.

Example

You might use balls of different sizes and blocks or cubes to illustrate this objective. This activity can be done indoors also. A discussion of plain and curved surfaces could follow.

THREE-DIMENSIONAL GEOMETRY (cont'd)

Objective 1TG3

The Primary pupil, given concrete objects such as fruits, vegetables or building blocks, will be able to explore their shapes and textures.

Example

After classroom lesson on the meaning of "colour", "thickness", "texture", and "size", take the children for a walk. You might consider a small group of 4 with a senior helper. Have the pupils look for articles in nature that would fall into these categories. On returning to the school have the pupils place these articles in the proper categories on a large piece of paper.

Colour		Thickness		Texture	
Red	Yellow	Thick	Thin	Rough	Smooth
Green	Mixture	Large	Small	Fully	Bumpy

Follow-up

Blindfold Guessing

The pupils take turns being blindfolded and the other pupils give the blindfolded pupil a nature article. Using touch techniques, the pupil tries to guess what the article is.

Objective 1TG4

The Primary pupil, using the concept of the geo-board, will be able to use pegs and a string to define an area or areas.

Example

You might use tent pegs to make the four corners. Coloured string adds to the effectiveness. Pupils could stand inside this quadrant. Tiles on the floor could be examined on a rainy day.

THREE-DIMENSIONAL GEOMETRY (cont'd)

Objective 1TG5

The Primary pupil, using a geo-board and elastic, or pegs and string, will be able to construct straight lines, squares, rectangles and triangles.

Example

A geo-board can be constructed easily by pasting a piece of centimetre paper on a little board and hammering tack nails at each corner.

Objective 2TG1

The Primary pupil will be able to identify line segments, points and curves on the school yard.

Example

Examine mortar between bricks, pavement sections, flower beds, equipment and hand rails.

The pupils will list on a chart the areas that fall into each of the categories. Pupils should estimate and then measure the line segment or curve with string or standard unit, for example - an arm or a finger.

Line Segments	
Points	
Curves	

This particular section could be done in two lessons:

1 - school yard
2 - a nature walk

On the nature walk, the pupils will have to look very closely for the same features.

THREE-DIMENSIONAL GEOMETRY (cont'd)

Objective 2TG2

The Primary pupil will be able to categorize shapes in nature according to colour, thickness, texture and size.

Example — See Objective 1TG3. This will be further reinforcement.

Objective 3TG1

The Primary pupil, using various metric containers and rice, beans, sand, salt or flour, will be able to fill these containers to determine their volume.

Example — Beans and rice are easier to work with.

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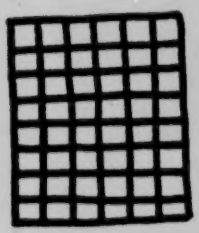
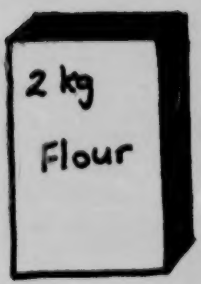
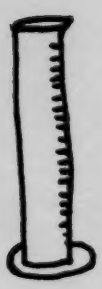
MEASUREMENT







K. Hart

Unit MEASUREMENT

Aim **The Primary pupil uses measurement in relevant situations with an understanding of the concepts involved.**

Topic Linear Measurement

Location School Yard

General Objective

The Primary pupil demonstrates measurement skills using the relationships between different units of length.

Specific Objectives

KLM1(a) The Kindergarten pupils, working in pairs, will be able to outline their shadows with chalk on the pavement.

KLM1(b) The Kindergarten pupil will be able to compare the sizes of objects such as trees, shrubs, flag poles, fence posts, seeds, vegetables, windows and people.

KLM2 The Kindergarten pupil will be able to rank the objects in KLM1(b) according to size.

KLM3 The Kindergarten pupil will be able to recognize the larger of two surfaces.

KLM4 The Kindergarten pupil will be able to measure the surfaces listed in KLM3 by covering them with similar non-standard units.

KLM5 The Kindergarten pupil, using sand, will be able to compare the sizes of various containers.

KLM6 The Kindergarten pupil will be able to recognize objects as being heavy or light.

KLM7 The Kindergarten pupil will be able to make daily observations to obtain information for constructing weather and season charts.

KLM8 The Kindergarten pupil, based on outdoor experiences with the senses, will be able to use the terms hot and cold.

MEASUREMENT (cont'd)

Specific Objectives (cont'd)

1LM1 The Primary pupil will be able to measure the lengths of outdoor objects using non-standard units such as arms around a tree, hands, shoes and pencils.

1LM2 The Primary pupil, through the measurement of outdoor objects, will be able to recognize the need for a standardized unit.

1LM3 The Primary pupil, using cardboard squares, will be able to measure various outdoor surfaces.

1LM4 The Primary pupil, using sand, water and snow, will be able to estimate and measure the number of small containers required to fill a given larger container.

1LM5 The Primary pupil, through the measurement of outdoor objects, will be able to recognize the need for a standard unit of volume.

1LM6 The Primary pupil, using the standard unit for volume, will be able to determine the capacity or volume of a given container.

1LM7 The Primary pupil, using a standard unit, will be able to determine the capacity or volume of differently shaped containers.

1LM8 The Primary pupil will be able to identify the heavier of two objects.

1LM9 The Primary pupil will be able to use the simple equal arm balance (2-pan balance) to determine the heavier of two objects.

1LM10 The Primary pupil will be able to use the weather chart as a method of learning the days of the week.

1LM11 The Primary pupil will be able to relate outdoor experiences to the terms hot, cold, warm and cool.

2LM1 The Primary pupil will be able to estimate and measure in standard units such outdoor objects as the playing field, flower bed, or school.

2LM2 The Primary pupil, using cardboard squares, tiles and blocks, will be able to estimate and measure the area of irregular outdoor surfaces.

MEASUREMENT (cont'd)

Specific Objectives (cont'd)

2LM3 The Primary pupil will be able to use non-standard units to find the weight of various outdoor objects.

3LM1 The Primary pupil will be able to use standard metric units to measure the length of outdoor objects.

3LM2 The Primary pupil, given a measurement to the nearest unit, will be able to mark or construct a line segment.

3LM3 The Primary pupil will be able to determine the area of a given rectangle in square metres.

3LM4 The Primary pupil will be able to measure the volume or capacity of a given container using sand, water and snow.

3LM5 The Primary pupil will be able to gather objects from the environment and classify them according to those weighing more, equal to, or less than a given unit.

3LM6 The Primary pupil, using a thermometer, will be able to estimate, compare and record daily outdoor temperatures in Celsius.

LINEAR MEASURFMENT

Objective KLM1(a)

The Kindergarten pupils, working in pairs, will be able to outline their shadows with chalk on the pavement.

Example — This should be done twice during the class time, with one time close to noon, and one earlier or later in the day. This allows pupils to observe long and short shadows.

Objective KLM1(b)

The Kindergarten pupil will be able to compare the sizes of objects such as trees, shrubs, flag poles, fence posts, seeds, vegetables, windows and people.

Example — By observation and measurement the pupil will understand the concept of tall vs short, big vs little, far vs near and large vs small.

(See Primary Appendix "E")

Objective KLM2

The Kindergarten pupil will be able to rank the objects in KLM1(b) according to size.

Example — Rank by longest and shortest.

(See Primary Appendix "F")

Objective KLM3

The Kindergarten pupil will be able to recognize the larger of two surfaces.

Example — Footprints in the snow; amount of paved area to grass.

LINEAR MEASUREMENT (cont'd)

Objective KLM4

The Kindergarten pupil will be able to measure the surfaces listed in KLM3 by covering them with similar non-standard units.

Example — Squared paper could be used providing the area is not too large.

Objective KLM5

The Kindergarten pupil, using sand, will be able to compare the sizes of various containers.

Example — Use metric containers if possible.

Objective KLM6

The Kindergarten pupil will be able to recognize objects as being heavy or light.

Example — Have pupils work with beans, pennies, bikes, stones, sawdust, etc.

Objective KLM7

The Kindergarten pupil will be able to make daily observations to obtain information for construction weather and season charts.

Example — Tabulate data on a classroom chart. A monthly calendar on the wall is useful in reinforcing concepts of yesterday, today, tomorrow, week, month and season.

(See Primary Appendix "G")

LINEAR MEASUREMENT (cont'd)

Objective KLM8

The Kindergarten pupil, based on outdoor experiences with the senses, will be able to use the terms hot and cold.

Objective 1LM1

The Primary pupil will be able to measure the lengths of outdoor objects using non-standard units such as arms around a tree, hands, shoes and pencils.

Objective 1LM2

The Primary pupil, through the measurement of outdoor objects, will be able to recognize the need for a standardized unit.

Example — In a classroom situation the pupil will measure objects by using his shoe as a standard unit. How many shoe lengths?, etc. By doing this he or she will determine the number of shoe lengths in the object.

Objective 1LM3

The Primary pupil, using cardboard squares, will be able to measure various outdoor surfaces.

Example — How many squares will cover: a hop-scotch pattern?
a hula-hoop
steps

LINEAR MEASUREMENT (cont'd)

Objective 1LM4

The Primary pupil, using sand, water and snow, will be able to estimate and measure the number of small containers required to fill a given larger container.

Example — Use metric containers. Guess, then measure, and verbalize using metric terms as often as possible to further familiarize pupils with terms.

Objective 1LM5

The Primary pupil, through the measurement of outdoor objects, will be able to recognize the need for a standard unit of volume.

Example — THIS IS A CLASSROOM ACTIVITY

Objective 1LM6

The Primary pupil, using the standard unit for volume, will be able to determine the capacity or volume of a given container.

Example — Pupils could bring in empty metric containers from home to determine their volume by pouring sand in or dumping sand out of various containers.

Objective 1LM7

The Primary pupil, using a standard unit, will be able to determine the capacity or volume of differently shaped containers.

Example — Use metric containers.

LINEAR MEASUREMENT (cont'd)

Objective 1LM8

The Primary pupil will be able to identify the heavier of two objects.

Example — Stones vs rocks, bricks vs blocks and sand pails, with and without sand.

Objective 1LM9

The Primary pupil will be able to use the simple equal arm balance (2-pan balance) to determine the heavier of two objects.

Example — Pebbles vs coins.

Objective 1LM10

The Primary pupil will be able to use the weather chart as a method of learning the days of the week.

Example — Make a weather chart for the current month.

Objective 1LM11

The Primary pupil will be able to relate outdoor experiences to the terms hot, cold, warm and cool.

Objective 2LM1

The Primary pupil will be able to estimate and measure in standard units such outdoor objects as the playing field, flower bed or school.

Example — Use tape measure and metric trundle wheel.

LINEAR MEASUREMENT (cont'd)

Objective 2LM2

The Primary pupil, using cardboard squares, tiles and blocks, will be able to estimate and measure the area of irregular outdoor surfaces.

Example — Hop-scotch pattern, homeplate.

Objective 2LM3

The Primary pupil will be able to use non-standard units to find the weight of various outdoor objects.

Example — So many centicubes could be compared to the weight of a pebble.

Objective 3LM1

The Primary pupil will be able to use standard metric units to measure the length of outdoor objects.

Example — Use metric tapes, trundle wheel, and metre sticks.

Objective 3LM2

The Primary pupil, given a measurement to the nearest unit, will be able to mark or construct a line segment.

Example — Long mesurement is suitable to outdoors. Use pylons to measure distance between them.

LINEAR MEASUREMENT (cont'd)

Objective 3LM3

The Primary pupil will be able to determine the area of a given rectangle in square metres.

Example — Chalk in an area on the pavement and then measure it.

Objective 3LM4

The Primary pupil will be able to measure the volume or capacity of a given container using sand, water and snow.

Example — Use metric containers.

Objective 3LM5

The Primary pupil will be able to gather objects from the environment and classify them according to those weighing more, equal to, or less than a given unit.

Example — Use balances to compare weight.

Objective 3LM6

The Primary pupil, using a thermometer, will be able to estimate, compare and record daily outdoor temperatures in Celsius.

Example — Use a graph sheet to graph morning and afternoon temperatures and note the difference.

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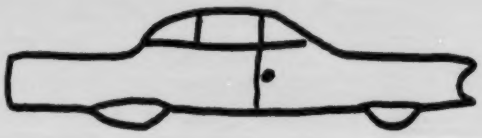
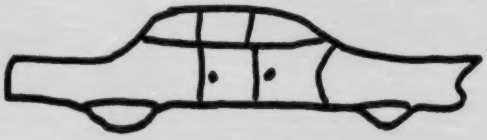
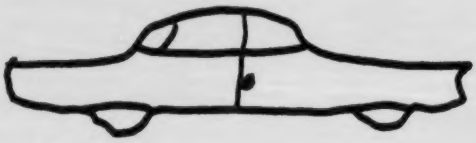
PW02 Classify according to colour and number of doors

Red 1 door 2 door

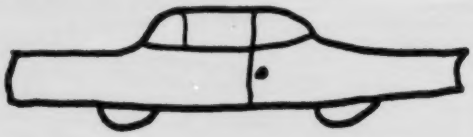


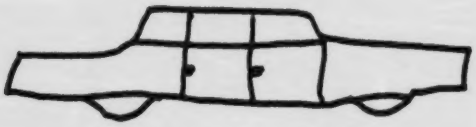


Blue 1 door 2 door

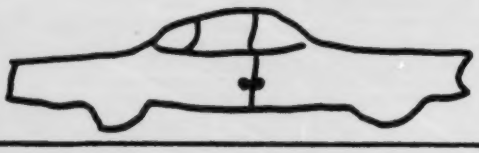


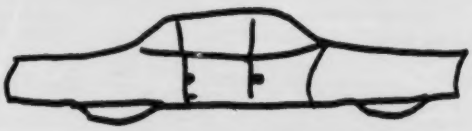
Yellow 1 door 2 door



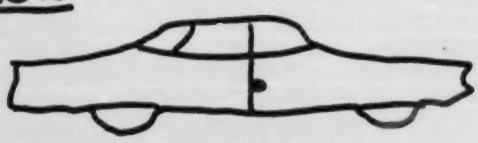


Green 1 door 2 door





Black 1 door 2 door



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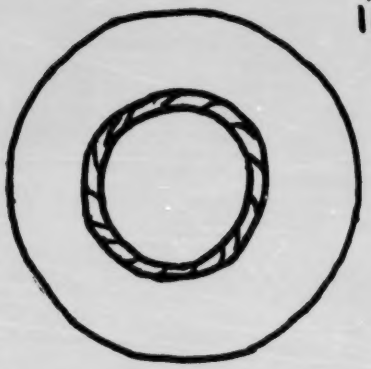
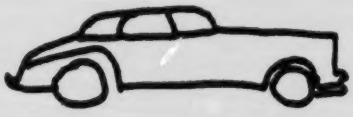
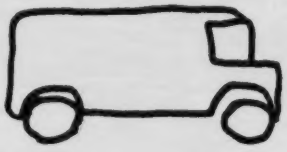
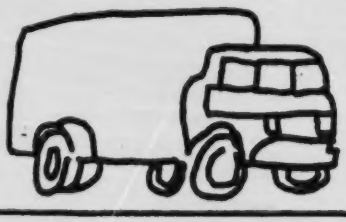
Wheels PW03 in our Parking Lot



Count

wheels on Cars 	
wheels on Vans 	
wheels on Trucks 	
wheels on Bicycles	

Total

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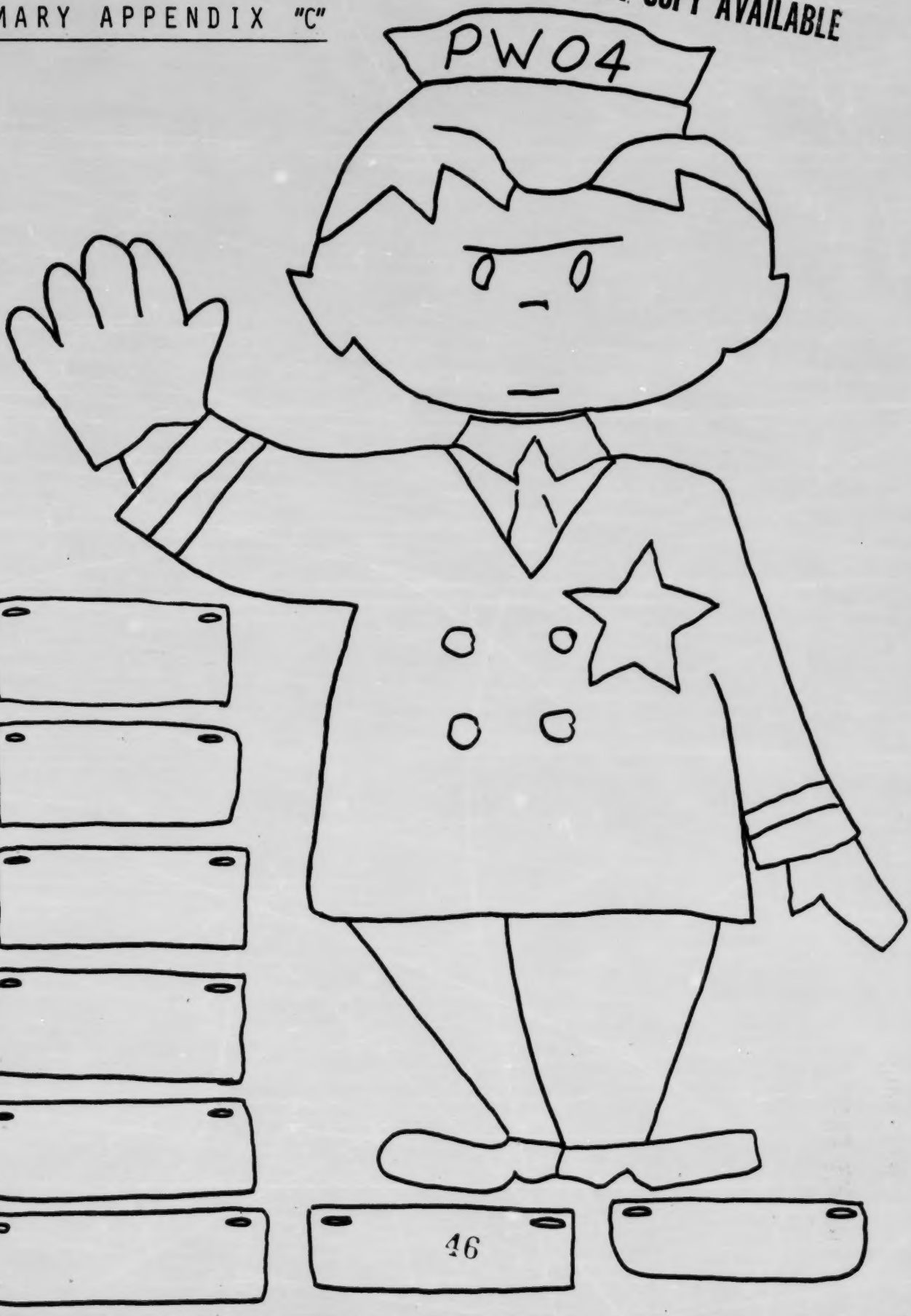

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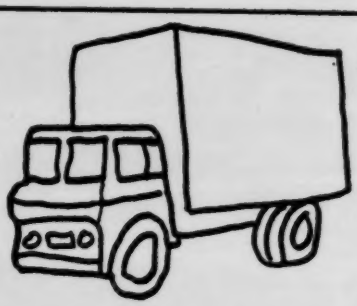
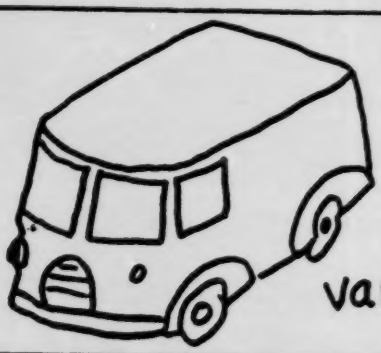
PW05 - Count and Record the number of vehicles passing the school in a given period of time.

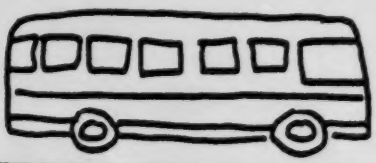
car



truck



van



bus

bicycle

My name is _____

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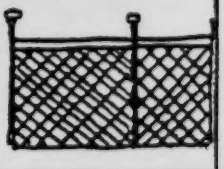
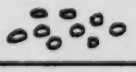
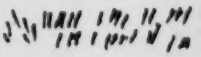
Cut and Paste

KLM1 Compare sizes of Various Objects

Tall		Short	
Trees	Flowers	School Fence 	Rocks 
Garbage pail	Swing set	Flag Pole	grass 

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KLM2

Longest - Shortest

CUT

Cut and Paste in order according to size

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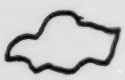
Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.

Sunny Day



Cloudy

Rainy

Snowy

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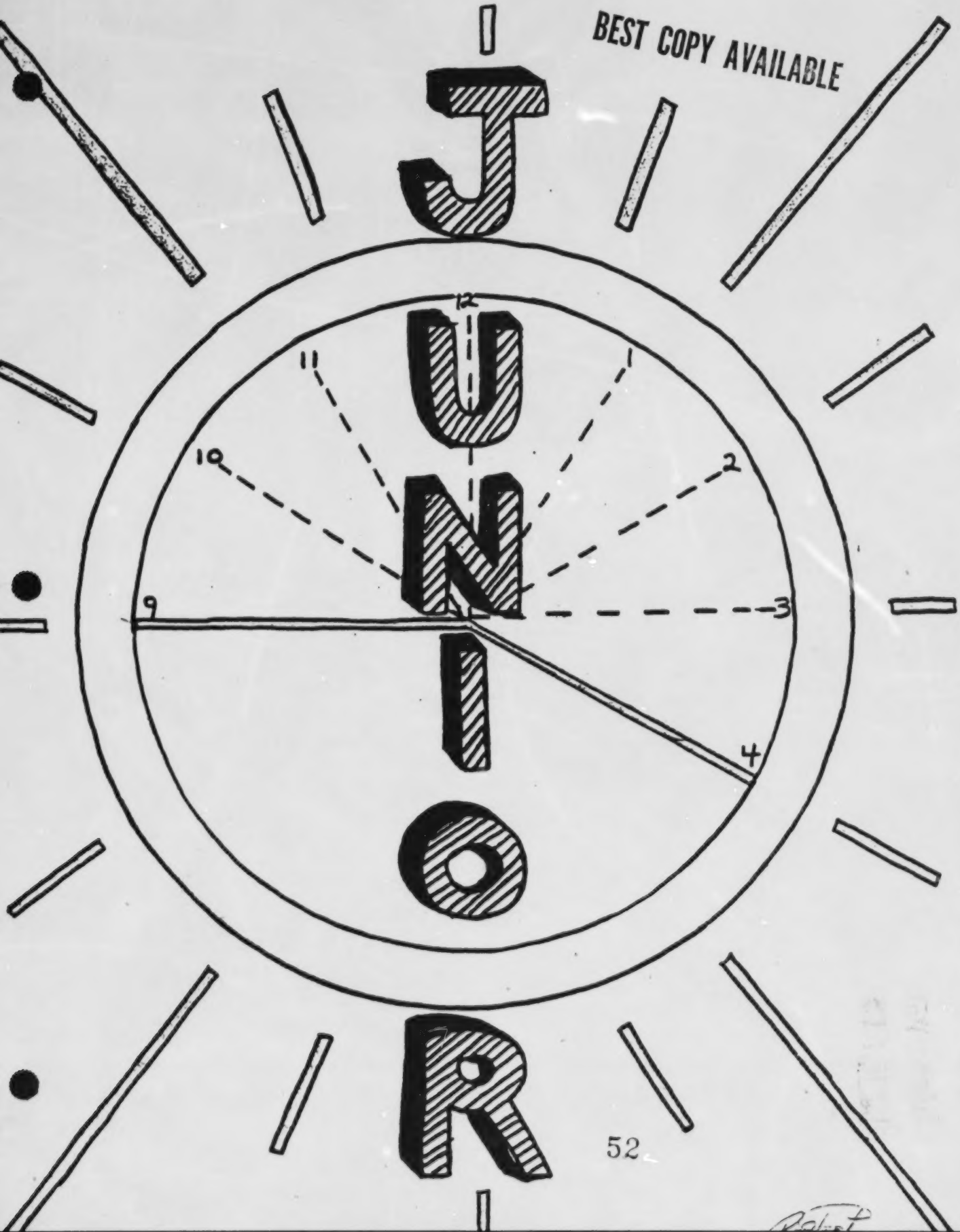

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WHOLE NUMBERS

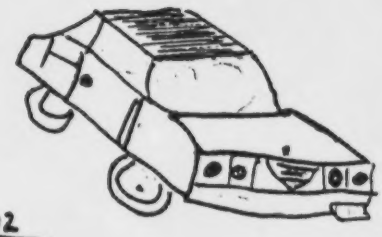
Maps

JVV 902

KJH 223

KLH 323

Bikes

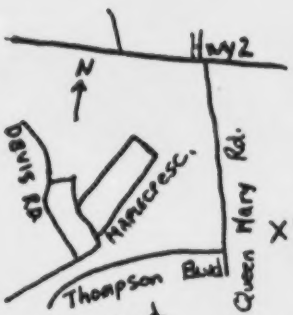


Menu For Camping Trip

hamburger	salt
buns	pepper
relish	bananas
catsup	beans
Tomatoes	weiners
Onions	
eggs	
bacon	
butter	
bread	

Monte Carlo

Chevette

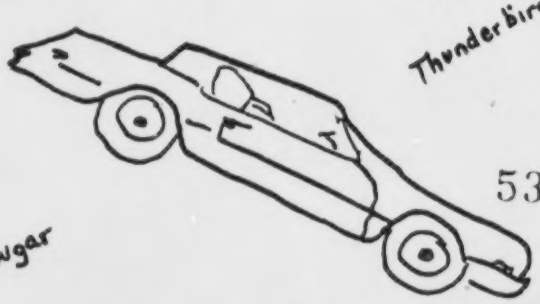


zephyr

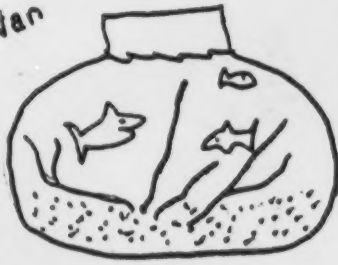
Thunderbird

Chevy Van

Grenada



Cougar



Books

Equipment

Unit WHOLE NUMBERS

Aim **The Junior pupil will use the school site as reinforcement for mathematical concepts and arithmetic operations involving whole numbers.**

Topic Operations Involving Vehicles

Location School Yard and Parking Lot

General Objective

The Junior pupil will develop further proficiency in the use of the standard algorithms for the four basic operations.

Specific Objectives

JW01 The Junior pupil will be able to perform addition and subtraction using three digit numbers which appear on licence plates. More advanced Junior pupils will be able to perform multiplication and division using the three digit numbers.

JW02 The Junior pupil, using a road map, will be able to determine the distance between various locations, and use these figures to perform the four operations.

JW03 The Junior pupil will be able to research costs of automobiles or bicycles and use these figures to calculate the total costs of all the vehicles in the teachers parking lot or bicycle rack.

JW04 The Junior pupil will be able to determine the cost of a suitable menu for one meal, a picnic or a camping trip.

JW05 The Junior pupil will be able to determine the costs of various personal articles, using newspaper ads and catalogues.

JW06 The Junior pupil will be able to count the number of specific plants in a different square metre (individually or with a partner). The pupils will add these and find an average per square metre of the incidence of that specific plant in the specified area.

OPERATIONS INVOLVING VEHICLES

Objective JW01

The Junior pupil will be able to perform addition and subtraction using three digit numbers which appear on the licence plates. More advanced Junior pupils will be able to perform multiplication and division using the three digit numbers.

Example

JYV 902
KJM 223

Objective JW02

The Junior pupil, using a road map, will be able to determine the distance between various locations, and use these figures to perform the four operations.

Example

A certain amount of introduction, for example - mapping areas outside, must be completed prior to this activity. Pupils might make treasure maps, maps showing routes to their homes, and orienteering routes also would be beneficial.

Pegs and string can be used to measure quadrants or distances.

Problems involving the four operations may be developed from this activity (one-step or two-step).

Objective JW03

The Junior pupil will be able to research costs of automobiles or bicycles and use these figures to calculate the total costs of all the vehicles in the teachers parking lot or bicycle rack.

Example

Monte Carlo	$8,796.00
Chevette	$5,428.00
Grenada	$6,951.00

Cougar	$ 72.95
3-Speed Racer	$ 86.95
Supercycle 10-Speed	$104.88

OPERATIONS INVOLVING VEHICLES (cont'd)

Objective JW04

The Junior pupil will be able to determine the cost of a suitable menu for one meal, a picnic or a camping trip.

Example — This objective is simplified by using newspaper ads, shopping lists, etc.

Objective JW05

The Junior pupil will be able to determine the costs of various personal articles, using newspapers ads and catalogues.

Example — Clothing, equipment, toys, books, hobbies, pets.

Objective JW06

The Junior pupil will be able to count the number of specific plants in a different square metre (individually or with a partner). The pupils will add these and find an average per square metre of the incidence of that specific plant in the specified area.

Example — Use pegs and a string to form a square metre. Do several locations throughout the play yard to determine the number of dandelion plants.

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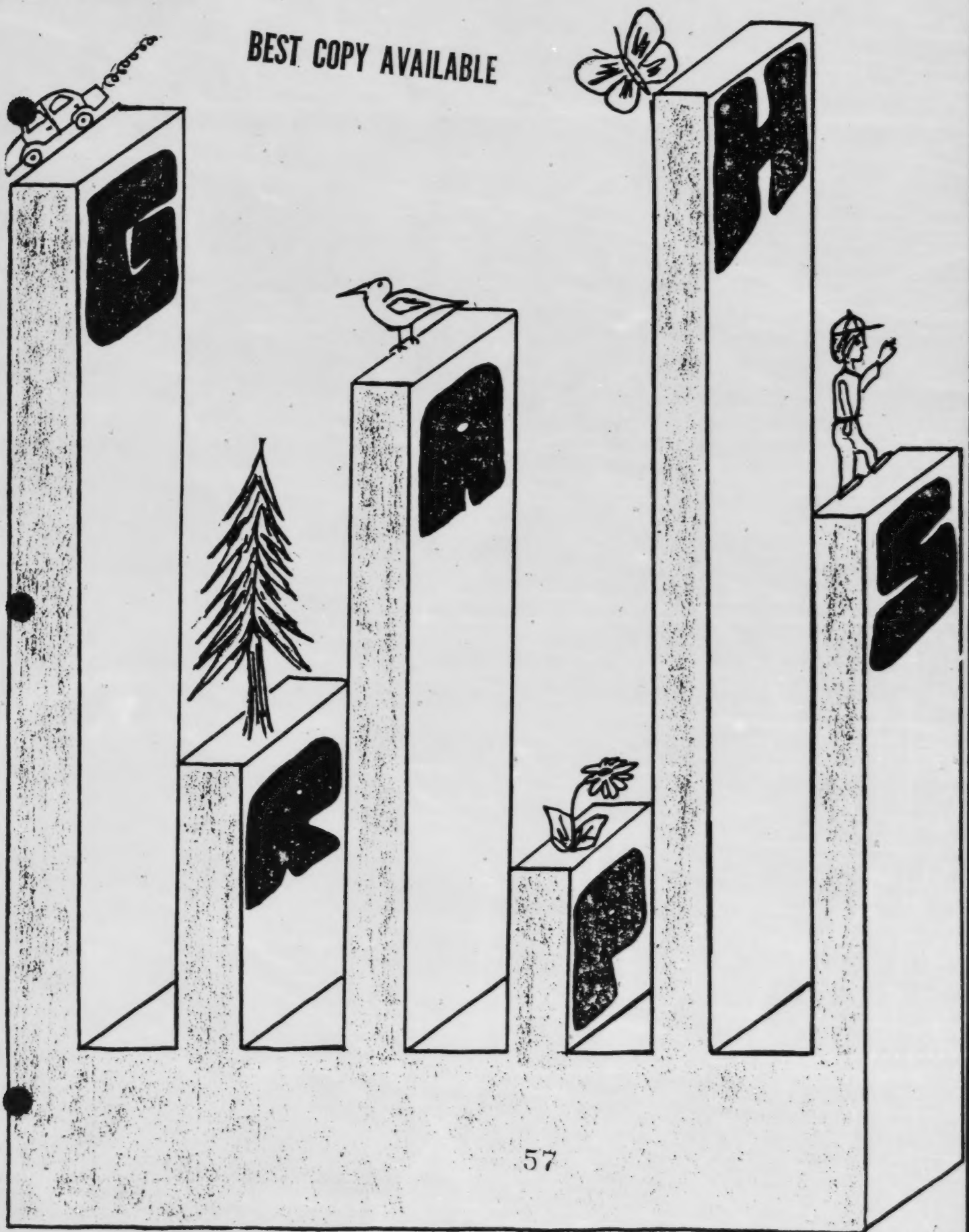

Unit GRAPHING

Aim **The Junior pupil will use the school site for reinforcement of mathematical concepts and arithmetic operations involving Picto, Line, Bar and Circle Graphs.**

Topic Circle, Picto, Line and Bar Graphs

Location School Yard and Nature Hike

General Objective

The Junior pupil will be able to construct graphs of various kinds and use them with understanding.

Specific Objectives

JG1 The Junior pupil will review the Primary Graphing Objectives.

JG2 The Junior pupil, under suitable winter conditions, will be able to compile information pertaining to distance/time of pupils on a "crazy carpet" slide.

JG3 The Junior pupil will be able to time the interval required for a vehicle to travel between two markers.

JG4 The Junior pupil, using electrical equipment, will be able to calculate and graph the number of batteries as compared to the intensity of the sound, and the intensity of the voltage.

JG5 The Junior pupil will be able to time with a stop watch, record and graph various track and field events, gymnastics and sports statistics.

JG6 The more advanced Junior pupil will be able to calculate and graph the volume of running water over a specific time.

JG7 The Junior pupil will be able to measure and graph, over a given period of time, the amount of precipitation.

JG8 The Junior pupil will be able to plant a given number of seeds (any number up to 100) and graph the percentage of germination, height and time of growth.

CIRCLE, PICTO, LINE AND BAR GRAPHS

Objective JG1

The Junior pupil will review the Primary Graphing Objectives.

Objective JG2

The Junior pupil, under suitable weather conditions, will be able to compile information pertaining to distance/time of pupils on a "crazy carpet" slide.

Example — Use a stop-watch or second hand on a watch.

Objective JG3

The Junior pupil will be able to time the interval required for a vehicle to travel between two markers.

Example — Using information recorded, the pupil will calculate speed, i.e. - kilometre/hour. Use a stop-watch or second hand on a watch.

Objective JG4

The Junior pupil, using electrical equipment, will be able to calculate and graph the number of batteries as compared to the intensity of the sound, and the intensity of the voltage.

Resources: — Have pupils use flashlight batteries, wire and bell. This is suggested for a small group activity or for a math activity centre.

Objective JG5

The Junior pupil will be able to time with a stop-watch, record and graph various track and field events, gymnastics and sports statistics.

CIRCLE, PICTO, LINE AND BAR GRAPHS (cont'd)

Objective JG6

The more advanced Junior pupil will be able to calculate and graph the volume of running water over a specific time.

Example — A water tap, container and timer is an effective method for collecting data for this graph. A comparative study involving rate of flow, a dripping tap, or a tap just barely open could also be carried out

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Objective JG7

The Junior pupil will be able to measure and graph, over a given period of time, the amount of precipitation.

Example — Snowfall is recommended for a layering graph of previous snowfalls.

Objective JG8

The Junior pupil will be able to plant a given number of seeds (any number up to 100) and graph the percentage of germination, height and time of growth.

Unit GRAPHING

Aim The Junior pupil will use the school site and maps as reinforcement for mathematical concepts and arithmetic operations involving collection and processing of data.

Topic Statistics

Location School Yard and Maps

General Objective

The Junior pupil will develop further proficiency in collecting, researching and processing information.

Specific Objectives

JS1 The Junior pupil will be able to identify and classify the various types of trees or shrubs in a specific area or quadrant, and calculate the population density of each type.

JS2 The Junior pupil will be able to obtain information regarding the number of pupils or teachers in the school and calculate the average number of pupils per class throughout the school.

JS3 The Junior pupil will be able to divide the school yard into four quadrants and collect gum wrappers, etc., for a statistical analysis of the distribution of litter.

JS4 The Junior pupil will be able to count the number of insects in a square metre of the school yard.

JS5 The Junior pupil will be able to calculate the area of the school yard in square metres and determine the insect population in this area.

JS6 The Junior pupil, using a map of North America, will be able to locate and calculate the distance travelled by birds during migration.

STATISTICS

Objective JS1

The Junior pupil will be able to identify and classify the various types of trees or shrubs in a specific area or quadrant, and calculate the population density of each type.

Objective JS2

The Junior pupil will be able to obtain information regarding the number of pupils or teachers in the school and calculate the average number of pupils per class throughout the school.

Example A similar survey could be done involving ages, weights, etc.

Objective JS3

The Junior pupil will be able to divide the school yard into four quadrants and collect gum wrappers, etc., for a statistical analysis of the distribution of litter.

Example Determine the number of kinds of wrappers, gum flavours, etc.

Objective JS4

The Junior pupil will be able to count the number of insects in a square metre of the school yard.

Objective JS5

The Junior pupil will be able to calculate the area of the school yard in square metres and determine the insect population in this area.

STATISTICS (cont'd)

Objective JS6

The Junior pupil, using a map of North America, will be able to locate and calculate the distance travelled by birds during migration.

Example — A map showing the Eastern, Central and Pacific flyways would be ideal.

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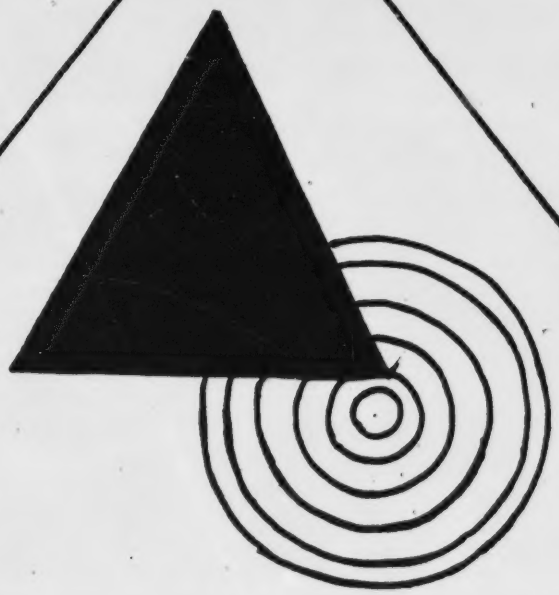
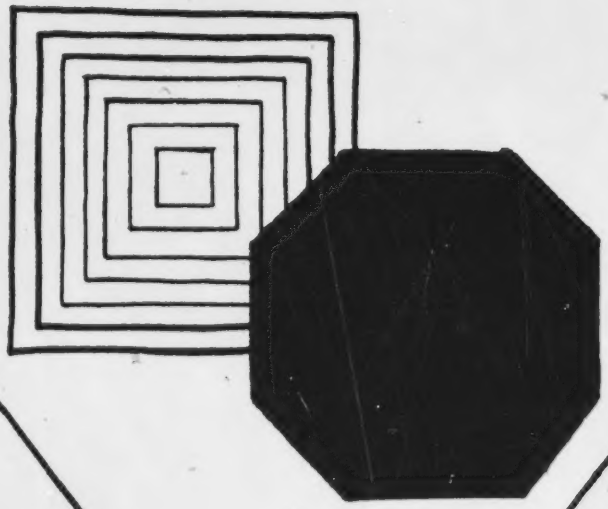


GEOMETRY



K. Hart

Unit GEOMETRY

Aim **The Junior pupil understands that Geometry is the natural language of spatial concepts and space relationships in the real world.**

Topic Three-Dimensional Geometry

Location School Yard and Nature Hikes

General Objective

The Junior pupil will be able to understand relationships involving space and shape.

Specific Objectives

4TG1 The Junior pupil will review the geometric shapes and basic solids as found in the surrounding area.

4TG2 The Junior pupil will be able to use games to reinforce the concepts of centre, radius, diameter and circumference.

4TG3 The Junior pupil will be able to form 90 degree angles (square angles).

4TG4 The Junior pupil will be able to discover intersecting lines, line segments and points.

4TG5 The Junior pupil will be able to recognize open and closed curves.

5TG1 The Junior pupil, in the surrounding area, will be able to recognize and identify triangular shapes, including equilateral, isosceles and scalene triangles.

5TG2 The Junior pupil will be able to identify hexagons and pentagons in nature.

5TG3 The Junior pupil will be able to construct circles using string, pegs and persons.

5TG4 The Junior pupil will be able to estimate and measure angles in materials from nature.

5TG5 The Junior pupil will be able to determine circumferences of trees, posts and legs.

GEOMETRY (cont'd)

Specific Objectives: (cont'd)

6TG1 The Junior pupil will be able to recognize parallel lines in the school environment, gym, sidewalks, walls, yard and playing field. The pupil will relate these observations to squares, parallelograms and rhombuses.

6TG2 The Junior pupil will be able to construct and measure triangles, using string, straws, toothpicks, sticks, bones, beads and plasticine.

6TG3 The Junior pupil will be able to use a trundle wheel to determine the perimeter of playing fields, flower beds, sidewalks, and the school building.

6TG4 The Junior pupil will be able to construct and cut out various shapes and create tessellations (tiling patterns) with no gaps or overlapping on the plane surface.

THREE-DIMENSIONAL GEOMETRY

Objective 4TG1

The Junior pupil will review the geometric shapes and basic solids as found in the surrounding area.

Example

After a classroom lesson and discussion of geometric shapes an ideal follow-up activity is simply a walk out into the school yard to identify where these shapes occur in our environment. These may simply be pointed out and noted as they are discovered by the pupil, or a worksheet, possibly doubling as an evaluation method, could be used.

(See Junior Appendix "A" for Example Worksheet)

By means of oral questioning or by the method of copying an object seen from the schoolyard, the teacher will determine the degree of recognition.

Resources: Kit #38042 - Geometric Plastic Forms (available from the Board Office)
Video BPN 143807 - Solids (available from the Learning Materials Centre)

Objective 4TG2

The Junior pupil will be able to use games to reinforce the concepts of centre, radius, diameter and circumference.

Example

Games: dodge ball, fox and goose

An outdoor physical education class playing fox and goose provides an excellent opportunity to teach or reinforce the concepts of centre, radius, diameter and circumference. Continual emphasis on use of proper terminology by all involved in the game will soon familiarize the students with, and make them comfortable with, the use of the aforementioned terms.

(See Junior Appendix "B" for Example Worksheet)

Given a diagram showing the pertinent parts and following written instructions the student will colour code the diagram thus identifying these parts, for example:
-Colour the centre "red"
-Colour the diameter "yellow"
-Colour the radius "blue"
-Colour the circumference "green"

THREE-DIMENSIONAL GEOMETRY (cont'd)

Objective 4TG3

The Junior pupil will be able to form 90 degree angles (square angles).

Example: Folding paper

(Cross reference with 4PG6 - Plane Geometry, The Leeds and Grenville County Board of Education Junior Math Guideline, January 1979)

Objective 4TG4

The Junior pupil will be able to discover intersecting lines, line segments and points.

Example Observe wire fences, back stop, baseball diamonds, sidewalk tiles, basketball nets and screens on windows.

To illustrate that the intersection of lines need not be confined to two lines drawn on a page, the student could be presented the task of locating and listing a number of examples of the same found in the school yard.

1. List 5 examples of intersecting lines you see on the school yard.

2. Are the following examples of intersecting lines? Answer "Yes" or "No".

   a) horizontal mortar lines between bricks;
   b) sidewalk and hall tile joints;
   c) fence wires;
   d) window frames.

A follow-up activity to this objective could consist of an identify check list or a series of true or false statements.

THREE-DIMENSIONAL GEOMETRY (cont'd)

Objective 4TG5

The Junior pupil will be able to recognize open and closed curves.

Example

Observe overhead telephone wires, flowers and flower beds.

Selecting curved objects found on the school yard or elsewhere in the environment, the student will classify each as being open or closed curves. On a trip away from the school one of the assigned tasks could be to locate and sketch ten examples each of closed and open curves.

Given a list of objects found in our environment, the student classifies each.

(Cross reference with 4PG3 - The Leeds and Grenville County Board of Education Junior Math Guideline, January 1979)

THREE-DIMENSIONAL GEOMETRY (cont'd)

Objective 5TG1

The Junior pupil, in the surrounding area, will be able to recognize and identify triangular shapes, including equilateral, isosoceles and scalene triangles.

Example

After establishing the properties and characteristics of triangular shapes and distinguishing between equilateral, isosceles and scalene triangles, the students will locate and identify these as they occur in their natural and cultural environment.

Interjection of these environmental examples in an identification worksheet adequately prove the students familiarity with these terms and their practical application as opposed to only theory.

Objective 5TG2

The Junior pupil will be able to identify hexagons and pentagons in nature.

Example

Observe turtle shells, honey combs, hornet nests, starfish, etc. Identification of hexagons, pentagons and circles as they occur in nature by means of a class collection of these items will reinforce the identification process and provide a practical application of otherwise seldom used theory.

Kit #38042 - Geometric Plastic Forms (available at the Board Office)

Objective 5TG3

The Junior pupil will be able to construct circles using string, pegs and persons.

Resources

The pupils can vary the radius. This can also be done in snow.

(Cross-reference with 5PG4 and 5PG5, The Leeds and Grenville County Board of Education Junior Math Guideline, January 1979)

THREE-DIMENSIONAL GEOMETRY (cont'd)

Objective 5TG4

The Junior pupil will be able to estimate and measure angles in materials from nature.

Example

A good exercise to reinforce estimation and measurement of angles is simply a worksheet requesting the estimation and measurement of given angular objects found around the school yard.

Teacher will determine pupil competency through aforementioned worksheet or include such examples as test items on a unit test.

(Cross-reference with 5PG2, The Leeds and Grenville County Board of Education Junior Math Guideline, January 1979)

Objective 5TG5

The Junior pupil will be able to determine circumferences of trees, posts and legs.

Example

Using string and metre sticks only, the pupil will discuss and determine a method of measuring the circumference of objects. Reinforcement activities consist of the application of this process to various objects found on the school yard or in the class.

THREE-DIMENSIONAL GEOMETRY (cont'd)

Objective 6TG1

The Junior pupil will be able to recognize parallel lines in the school environment, gym, sidewalks, walls, yard and playing field. The pupil will relate these observations to squares, parallelograms, and rhombuses.

Example — Using appropriate measuring devices, the pupil will test various lines and edges in the school yard to determine if the requirements for parallel lines have been met.

(Cross-reference with 6PG2, The Leeds and Grenville County Board of Education Junior Math Guideline, January 1979)

Objective 6TG2

The Junior pupil will be able to construct and measure triangles, using string, straws, toothpicks, sticks, bones, beads and plasticine.

Example — (Could cross-reference with 6PG3, The Leeds and Grenville County Board of Education Junior Math Guideline, January 1979)

Objective 6TG3

The Junior pupil will be able to use a trundle wheel to determine the perimeter of playing fields, flower beds, sidewalks and the school building.

Objective 6TG4

The Junior pupil will be able to construct and cut out various shapes and create tessellations (tiling patterns) with no gaps or overlapping on the plane surface.

Example — Pupils can make patterns and designs on the pavement using chalk.

(Cross-reference with 6PG3, Regular Polygons - page 324, from The Leeds and Grenville County Board of Education Junior Math Guideline, January 1979)

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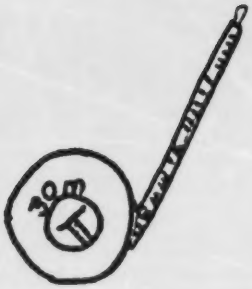
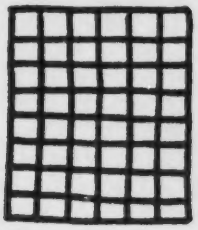
MEASUREMENT



Unit MEASUREMENT

Aim **The Junior pupil uses measurement in relevant situations with an understanding of the concepts involved.**

Topic Linear Measurement

General Objective

The Junior pupil demonstrates measurement skills using the relationships between different units of length.

Specific Objectives

4LM1 The Junior pupil will review the Primary Linear Measurement Objectives.

4LM2 The Junior pupil will be able to measure the lengths of various outdoor objects in centimetres.

4LM3 The Junior pupil will be able to measure the lengths of various outdoor objects in metres.

4LM4 The Junior pupil will be able to measure the lengths of various outdoor objects in millimetres.

4LM5 The Junior pupil will be able to use the term kilometre when planning field trips.

4LM6 The Junior pupil will be able to select the appropriate unit for the measurement of various outdoor objects.

4LM7 The Junior pupil will be able to estimate and measure lengths of objects selected from 4LM6 in metric units.

4LM8 The Junior pupil will be able to determine the perimeter of polygons in the outdoors.

4LM9 The Junior pupil will be able to use a string or metre tape to measure the perimeter of a circular shape.

5LM1 The Junior pupil will review the year 4 Linear Measurement Objectives.

5LM2 The Junior pupil will be able to convert previously measured outdoor objects or distances from one linear metric unit to another.

MEASUREMENT (cont'd)

Specific Objectives: (cont'd)

5LM3 The Junior pupil will be able to collect and measure objects of different lengths in wholes, halves and tenths of centimetres.

5LM4 The Junior pupil, using the data from 5LM3, will be able to convert the halves and tenths to decimal notation.

5LM5 The Junior pupil will be able to determine the perimeter of polygons in the outdoors.

5LM6 The Junior pupil will be able to use a string or metre tape to measure the perimeter of a circular shape.

5LM7 The Junior pupil will be able to discover the perimeter of various outdoor rectangular surfaces.

5LM8 The Junior pupil, using graph paper and irregular shaped objects found in the out-of-doors, will be able to discover their area.

5LM9 The Junior pupil, using the data found in 5LM8, will be able to recognize that figures with equal area may have different shape.

5LM10 The Junior pupil, by measuring lengths and widths of smaller rectangular outdoor surfaces, will be able to discover that the area can be expressed as their product.

5LM11 The Junior pupil will be able to calculate the area of larger surfaces on the school yard in square metres.

6LM1 The Junior pupil will review the year 5 Linear Measurement Objectives.

6LM2 The Junior pupil will be able to measure objects of varying lengths on the school yard and convert this data from one metric unit to any other metric unit using decimal notation.

LINEAR MEASUREMENT

Objective 4LM1

The Junior pupil will review the Primary Linear Measurement Objectives.

Objective 4LM2

The Junior pupil will be able to measure the lengths of various outdoor objects in centimetres.

Example — Doors, heighths of plants, fence posts, bricks and teeter-totters.

Objective 4LM3

The Junior pupil will be able to measure the lengths of various outdoor objects in metres.

Example — School yard, length of school, baseball diamond and soccer field.

Objective 4LM4

The Junior pupil will be able to measure the lengths of various outdoors objects in millimetres.

Example — Plant leaves, grass and bricks.

Objective 4LM5

The Junior pupil will be able to use the term kilometre when planning field trips.

Example — Bus routes. Maps of the route to be taken will be necessary.

LINEAR MEASUREMENT (cont'd)

Objective 4LM6

The Junior pupil will be able to select the appropriate unit for the measuremen of various outdoor objects.

Objective 4LM7

The Junior pupil will be able to estimate and measure lengths of objects selected from 4LM6 in metric units.

Objective 4LM8

The Junior pupil will be able to determine the perimeter of polygons in the outdoors.

Example — School building, parking lot, soccer field and hop-scoth pattern.

Objective 4LM9

The Junior pupil will be able to use a string or metre tape to measure the perimeter of a circular shape.

Example — Wheel, flower bed, hula-hoop, bottles.

LINEAR MEASUREMENT (cont'd)

Objective 5LM1

The Junior pupil will review the year 4 Linear Measurement Objectives.

Objective 5LM2

The Junior pupil will be able to convert previously measured outdoor objects or distances from one linear metric unit to another.

Objective 5LM3

The Junior pupil will be able to collect and measure objects of different lengths in wholes, halves and tenths of centimetres.

Example — This activity should be conducted inside the classroom for best results.

Objective 5LM4

The Junior pupil, using the data from 5LM3, will be able to convert the halves and tenths to decimal notation.

Example — An indoor activity is recommended.

Objective 5LM5

The Junior pupil will be able to determine the perimeter of polygons in the outdoors.

Example — Use a metre tape to measure the perimeter of the school building, parking lot, soccer field and hop-scotch pattern.

LINEAR MEASUREMENT (cont'd)

Objective 5LM6

The Junior pupil will be able to use a string or metre tape to measure the perimeter of a circular shape.

Example Wheel, flower bed, hula-hoop and bottles.

Objective 5LM7

The Junior pupil will be able to discover the perimeter of various outdoor rectangular surfaces.

Example Baseball diamond and soccer field. (Use a trundle wheel or long metre tape.)

Objective 5LM8

The Junior pupil, using graph paper and irregular shaped objects found in the out-of-doors, will be able to discover their areas.

Objective 5LM9

The Junior pupil, using the data found in 5LM8, will be able to recognize that figures with equal area may have different shapes.

Objective 5LM10

The Junior pupil, by measuring lengths and widths of smaller rectangular outdoor surfaces, will be able to discover that the area can be expressed as their product.

Objective 5LM11

The Junior pupil will be able to calculate the area of larger surfaces on the school yard in square metres.

LINEAR MEASUREMENT (cont'd)

Objective 6LM1

The Junior pupil will review the year 5 Linear Measurement Objectives.

Objective 6LM2

The Junior pupil will be able to measure objects of varying lengths on the school yard and convert this data from one metric unit to any other metric unit using decimal notation.

Example From short to long, (1) thickness of wire in fence;
(2) width of grass;
(3) length of school yard.

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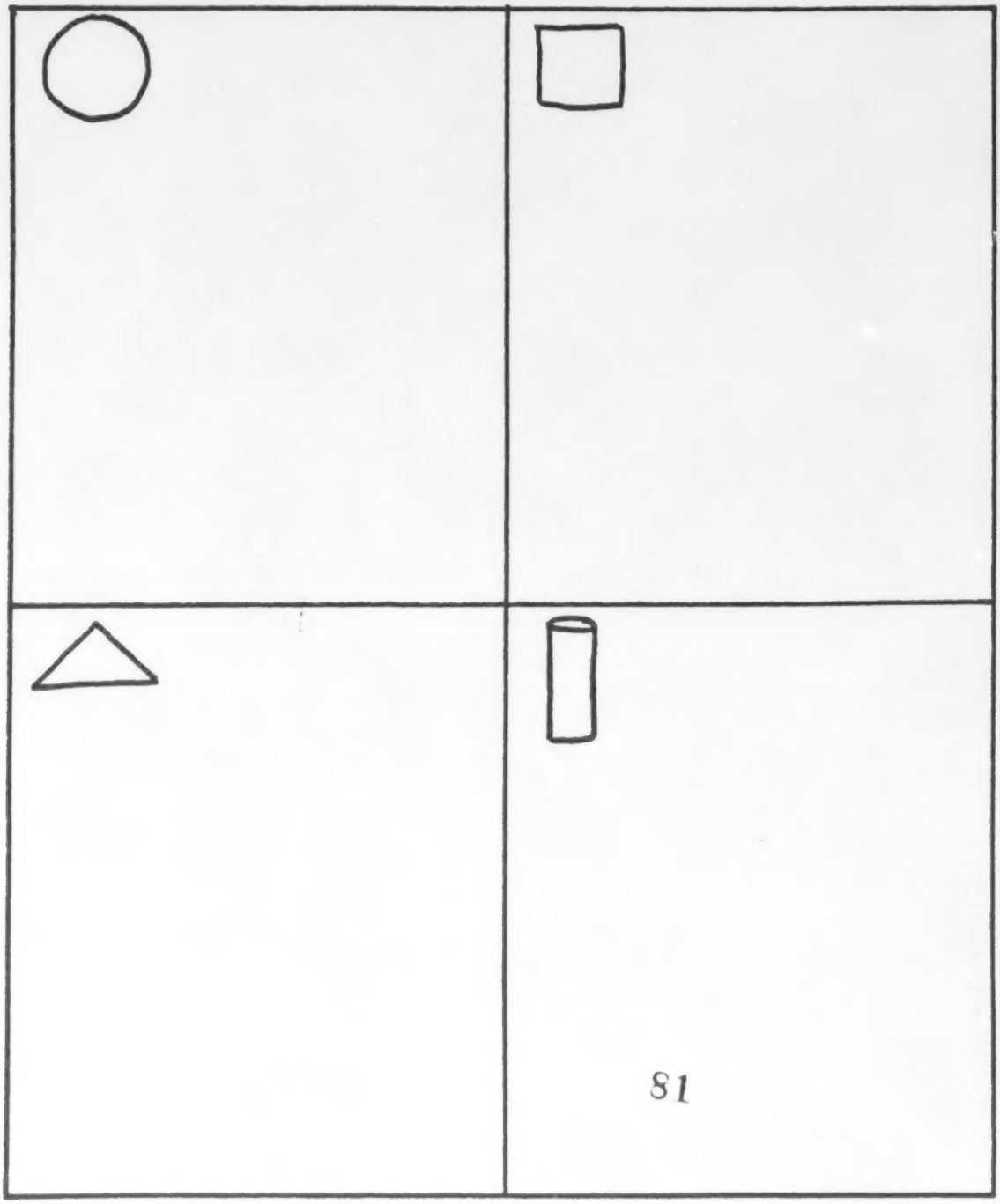
Objective 4TG1

Draw beside each shape four objects you saw from the school yard which have that shape in it.



Objective 4TG2

On the following diagram use marking pencils to illustrate the parts of a circle as indicated in the following colour scheme

centre	–	red
radius	–	blue
diameter	–	yellow
circumference	–	green